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NEW RECORDS OF CARIDEAN SHRIMPS (DECAPODA, CARIDEA) FROM THE NEARSHORE AREA OF PANAMA CITY BEACH, FLORIDA, U.S.A.

BY

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INTRODUCTION

Knowledge of the caridean shrimps from the Caribbean, Gulf of Mexico, and southeastern United States pertains primarily to their taxonomy and distribution. Caridean taxonomy has been studied by Chace (1972), Coutière (1909), Holthuis (1951, 1952, 1959), Manning (1963), Manning & Chace (1971), Schmitt (1935), Williams (1965), and Young (1900). Records of occurrences of caridean shrimps in the northeastern Gulf of Mexico have been presented by Abele (unpublished) and Wass (1955) from the Alligator Harbor area, and Abele (unpublished) and Hulings (1961) from the Panama City area. None of the species that are reported herein was recorded by any of these three authors. Manning & Chace (1971) and Chace (1972) reported the occurrence of three of the species in northwest Florida, but not from the Panama City area.

Records of the occurrence and a description of the habitat of 5 caridean species collected in benthic samples from the nearshore area of Panama City Beach, Florida, in 1974-75 are presented in this paper. The five species representing three families are: Ogyrididae, *Ogyrides alphaerostris* (Kingsley); Hippolytidae, *Tozeuma cornutum* A. Milne-Edwards; and Processidae, *Ambidexter symmetricus* Manning & Chace, *Processa hemphilli* Manning & Chace, and *Processa vicina* Manning & Chace. The three species in the family Processidae were recently described (Manning & Chace, 1971), while the other two species were described in 1880 and 1881, respectively. Our records extend the known range for two species, *P. hemphilli* and *T. cornutum*.

This report presents part of the results from a survey of benthic invertebrates of the nearshore area of the Gulf of Mexico off Panama City Beach, Florida. It was supported by Interservice Support Agreement Number CERC 75-28 between the U.S. Army Corps of Engineers and the National Marine Fisheries Service.

HABITAT DESCRIPTION AND STATION LOCATIONS

The nearshore area is characterized by white sandy beaches and relatively clear water. Two sand bars occur parallel to the beach. They change in shape and location

with changing water movements. The bottom slopes gradually; about 1 mile (1.85 km) seaward of the second sand bar, the depth is about 50 feet (15 m).

Benthic sampling stations were on nine transects perpendicular to the beach between West Pass and Phillips Inlet (fig. 1). Each transect had five stations representing five zones based on the contour of the substrate and depth. Station 1 was in the swash zone on the beach; Station 2 was about 50-75 ft (15-23 m) offshore on the first sand bar in 1-3 ft (0.3-1 m) of water; Station 3 was about 75 yds (69 m) offshore between the first and second sand bar in water depths of 8-10 ft (2.5 m); Station 4 was on the second sand bar about 150 yds (137 m) offshore in depths of 6-8 ft (2-2.5 m); and Station 5 was seaward of Station 4 in 10 ft (3 m) of water. Two additional stations (A and B) were located off Transects 5 and 8 respectively, in 30 ft (9 m) of water (fig. 1).

SAMPLING METHODS AND EQUIPMENT

Sampling was conducted from November 1974 through October 1975. Stations in the swash zone were sampled monthly, while the remaining stations were sampled quarterly (November 1974, February, May, and August 1975).

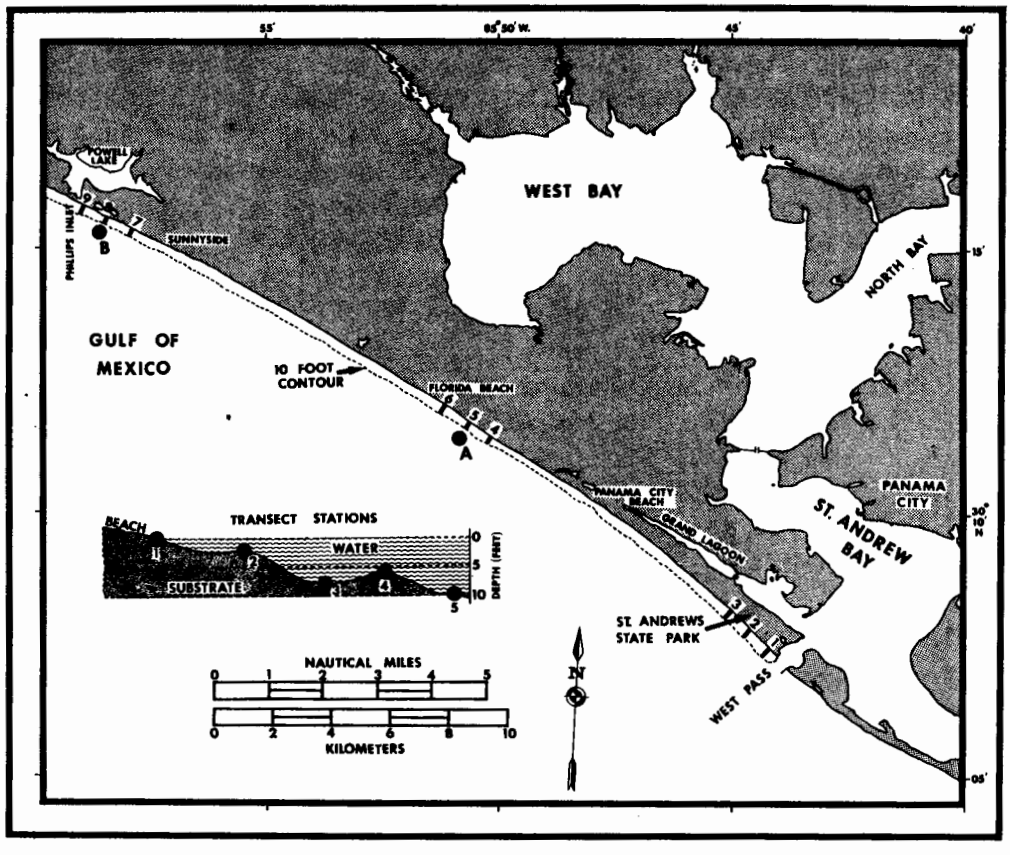

Fig. 1. Station and transect locations in the nearshore area of the Gulf of Mexico off Panama City Beach, Florida.

At each station, four plug samples were taken. The plug sampler was made of stainless steel, covered an area of 1/64 m^2, and penetrated to a depth of 23 cm. A stainless steel sieve (0.7 mm^2) was used for sieving the samples. Specimens were stained with Rose Bengal, preserved in 10% Formalin, later transferred to 70% isopropynol, and identified.

A sample for salinity and water temperature determinations was taken during each visit to Stations 1, 3, and 5 on all 9 transects and at Stations A and B. Water temperatures were measured with a mercury thermometer, and salinities were determined with a Goldberg refractometer.

A sample of sediment was taken during each station visit. Particle sizes of sediments larger than silt were determined by sieving the sample through a series of nested screens, separated by units of one phi. Pipette analyses were not necessary, because the silt-clay fraction of the sediments was less than one percent. Total carbon, organic carbon, and carbonate contents were determined by combustion in a LECO carbon analyzer. Sediment data from each station and sampling dates have been recorded elsewhere (Saloman, 1976).

RESULTS

Hydrology. — The average annual surface water temperature was 22.2° C. The highest average monthly temperature occurred during July (30.9° C) and the lowest in December (14.2° C). Temperatures ranged from 13.3 to 32.1° C.

The average annual surface salinity was 32.15‰. The highest average monthly salinity occurred during December (35.03‰) and the lowest in August (28.44‰). Salinities ranged from 23.67 to 35.39‰.

Sediments. — The surface sediments in this nearshore area were classified as sand, based on a sediment nomenclature triangle (after Shepard 1954, as modified by Rucker & Magan, 1964). The average weight percent of the sand size fraction was 99.75%. The weight percent of sand ranged from 93.01 to 100%. The mean grain size for all stations was 0.273 mm. The mean size of the sediments decreased slightly from 0.332 mm at stations in the swash zone to 0.217 mm at stations seaward of the second sand bar. The average standard deviation was 0.608 phi, and the average skewness and kurtosis values were -0.085 and 1.043, respectively. The average weight percents of the total carbon, organic carbon, and carbonate were 0.129, 0.048, and 0.083%, respectively.

Ambidexter symmetricus Manning & Chace, 1971

This species is known from Biscayne Bay and Florida Bay, and along Florida's west coast including Boca Ciega Bay, Seahorse Key, Cedar Key, and Alligator Harbor. Other distributional records are from Chandeleur Island, Louisiana; Tamaulipas, Ponta Piedras, and Laguna Madre de San Antonio, Mexico; Laja, and La Parquera, Puerto Rico; and Port of Spain, Trinidad (Manning & Chace, 1971).

Two juvenile specimens of *A. symmetricus* were collected from Transect 1, (fig. 2) one each in November and August. Both specimens had a carapace length

of 1.3 mm. This collection of *A. symmetricus* off Panama City provides additional records from the northeastern Gulf of Mexico.

The white sand bottom and a relatively high energy beach where *A. symmetricus* was found differs considerably from the habitats listed by Manning & Chace (1971). The majority of their specimens was recorded from beds of sea grass.

Processa vicina Manning & Chace, 1971

This species is known from North Carolina; northwestern Florida; and Isla de Margarita, Venezuela (Manning & Chace, 1971).

Three specimens of *P. vicina* were collected, one during May 1975 from Transect 1, and one each in August 1975 at Stations A and B (fig. 2). Previous records list this species only at depths ranging from 46 to 100 m, and on sand bottom with broken shell (Manning & Chace, 1971). My collection documents their occurrence in shallower water as well, as the depth at Station 4 on Transect 1 was between 2 and 2.5 m, while at Stations A and B the depth was 9.1 m.

The three specimens had carapace lengths of 1.1, 1.3, and 1.4 mm.

Processa hemphilli Manning & Chace, 1971

This species was previously known only from Marco, Collier County, Florida (Manning & Chace, 1971). Its presence in northwestern Florida extends the known range approximately 275 miles (463 km) northward.

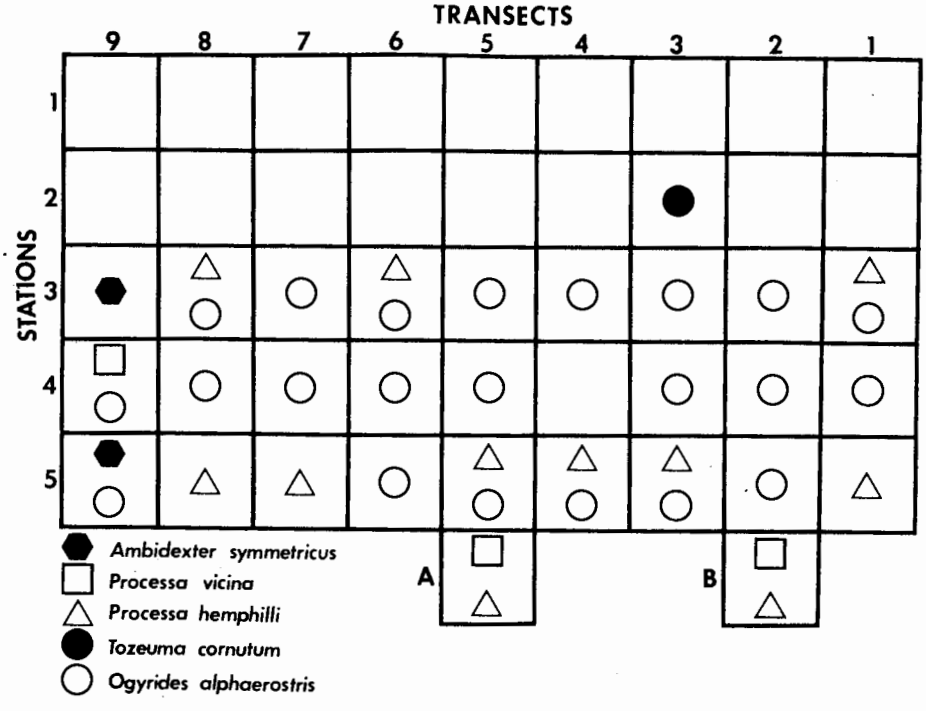

Fig. 2. Distribution of five species of caridean shrimp in the nearshore area of the Gulf of Mexico off Panama City Beach, Florida.

Thirty-eight specimens of *P. hemphilli* were collected. Over one-half of the individuals was collected at Stations A and B. The remainder was caught at stations located between the two sand bars and seaward of the second sand bar on Transects 2-7, and 9 (fig. 2). The absence of individuals at stations in the swash zone and on the first and second sand bars indicates a preference for a habitat which receives less wave energy.

Specimens were taken in November 1974, February, May, and August 1975; over one-half of the individuals was caught in May. The average carapace length was 1.9 mm, while the range was 1.4 to 2.7 mm.

Tozeuma cornutum A. Milne Edwards, 1881

This species was previously known from the type locality off Barbados at a depth of 73 meters, in deep water east of the Florida Keys, and from Saint John, Virgin Islands (Chace, 1972).

A single specimen was caught on Transect 7 in August 1975 (fig. 2). The depth at this station on the first sand bar was only 1 meter. Another specimen was collected off Mexico Beach, Florida, about 40 miles (74.1 km) east of Panama City Beach. The carapace lengths of the two above specimens were 1.6 and 1.5 mm, respectively. This extends the known range of *T. cornutum* north from the Caribbean and Florida Keys to the northeastern Gulf of Mexico.

Ogyrides alphaerostris (Kingsley, 1880)

This species is known from the type locality of Northampton County, Virginia. Its range is listed from Virginia to Georgia, northwestern Florida to Mississippi and Puerto Rico (Chace, 1972).

This species was the most abundant of the five species of carideans occurring in the nearshore area. A total of 126 individuals was caught. They were present at almost all stations seaward of the first sand bar on all transects (fig. 2). Stations between the two sandbars had 61% of the individuals; stations located on the second sand bar, 26%; and stations seaward of the second sand bar, 13%. The majority of individuals was collected in May and August (43 and 45%, respectively). Six of the individuals were gravid females; five of the six gravid individuals were caught in August, while the sixth was collected in February.

The occurrence of *O. alphaerostris* in the nearshore area off Panama City Beach, Florida, provides additional records for the northern Gulf of Mexico. Its presence on sand bars along the open ocean in shallow water of 1 to 18 m was also noted by Pearse, Humm & Wharton (1942) and Williams (1965).

The average carapace length of *O. alphaerostris* was 2.6 mm and ranged from 0.9 to 6.4 mm. Specimens above 5 mm carapace length were collected in all four sampling months, while small individuals (below 2 mm carapace length) were collected only in May and August. The average carapace length of the six gravid females was 5.6 mm, and the range was from 4.8 to 6.2 mm.

I thank Raymond B. Manning for the identification of the processids and the hippolytid.

ZUSAMMENFASSUNG

Fünf Garnelenarten wurden von der Littoralzone bei Panama City Beach, Golf von Mexiko, gesammelt und dokumentiert. Die Arten sind: *Ogyrides alphaerostris, Tozeuma cornutum, Ambidexter symmetricus, Processa hemphilli* und *Processa vicina.* Diese Angaben vergrössern das bis jetzt bekannte Verbreitungsgebiet von *T. cornutum* und *P. hemphilli.*

Die in der Nähe des Ufers gelegene Zone besteht aus einem weissen Sandstrand mit zwei parallel zur Küstenlinie liegenden Sandbänken. Die Oberflächensedimente bestanden aus über 99.7% Sand und waren beinahe einheitlich in Bezug auf die Verteilung der Partikelgrösse, des totalen und organischen Kohlenstoffes und der kohlensauren Salze.

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